

We claim:-

1. A process for preparing a polyamide by reacting a mixture  
5 which comprises a monomer which has a nitrile group and has  
at least one other functional group capable of forming a  
carboxamide group, and comprises water, in the presence of  
titanium dioxide as catalyst, which comprises using titanium  
10 dioxide whose BET surface area, determined to the German  
standard DIN 66 131 volumetrically by the multipoint method,  
is in the range from 5 to 35 m<sup>2</sup>/g.
2. A process as claimed in claim 1, where the titanium dioxide  
has a BET surface area in the range from 15 to 35 m<sup>2</sup>/g.
- 15 3. A process as claimed in claim 1 or 2, where the monomer has a  
nitrile group and, as at least one other functional group  
capable of forming a carboxamide group, has at least one  
group selected from the group consisting of nitrile group,  
20 carboxamide group, carboxylic acid group, ester group, and  
amino group.
4. A process as claimed in claim 1 or 2, where the monomer has  
been selected from the group consisting of dinitrile,  
25 nitrilocarboxamide, nitrilocarboxylic acid, nitrilocarboxylic  
ester, aminonitrile, and mixtures of these.
5. A process as claimed in claim 1 or 2, where the monomer is an  
aliphatic compound selected from the group consisting of  
30 alpha,omega-dinitrile, alpha,omega-nitrilocarboxamide, alpha,  
omega-nitrilocarboxylic acid, alpha,omega-nitrilocarboxylic  
ester, alpha,omega-aminonitrile, and mixtures of these.
6. A process as claimed in claim 1 or 2, where the monomer has  
35 been selected from the group consisting of adiponitrile,  
5-cyanovaleramide, 5-cyanovaleric acid, C<sub>1</sub>-C<sub>4</sub>-alkyl  
cyanovalerate, 6-aminocapronitrile, and mixtures of these.
7. A process as claimed in claim 1 or 2, where the monomer has  
40 been selected from the group consisting of adiponitrile,  
5-cyanovaleramide, 5-cyanovaleric acid, 6-aminocapronitrile,  
and mixtures of these.

## 17

8. A process as claimed in any of claims 3 to 7, where the monomer has been selected from the group consisting of dinitrile, nitrilocarboxamide, nitrilocarboxylic acid, nitrilocarboxylic ester, and mixtures of these and is used together with a diamine, the molar ratio of the monomer mentioned to the diamine mentioned being in the range from 0.9:1 to 1:0.9.
9. A process as claimed in claim 8, where the diamine used comprises a compound selected from the group consisting of 1,2-diaminoethane, 1,3-diaminopropane, 1,4-diaminobutane, 1,5-diaminopentane, 2-methyl-1,5-diaminopentane, 1,6-diaminohexane, 1,7-diaminoheptane, 1,8-diaminooctane, 1,9-diaminononane, 1,10-diaminodecane, and mixtures of these.

15

20

25

30

35

40

45